SONY

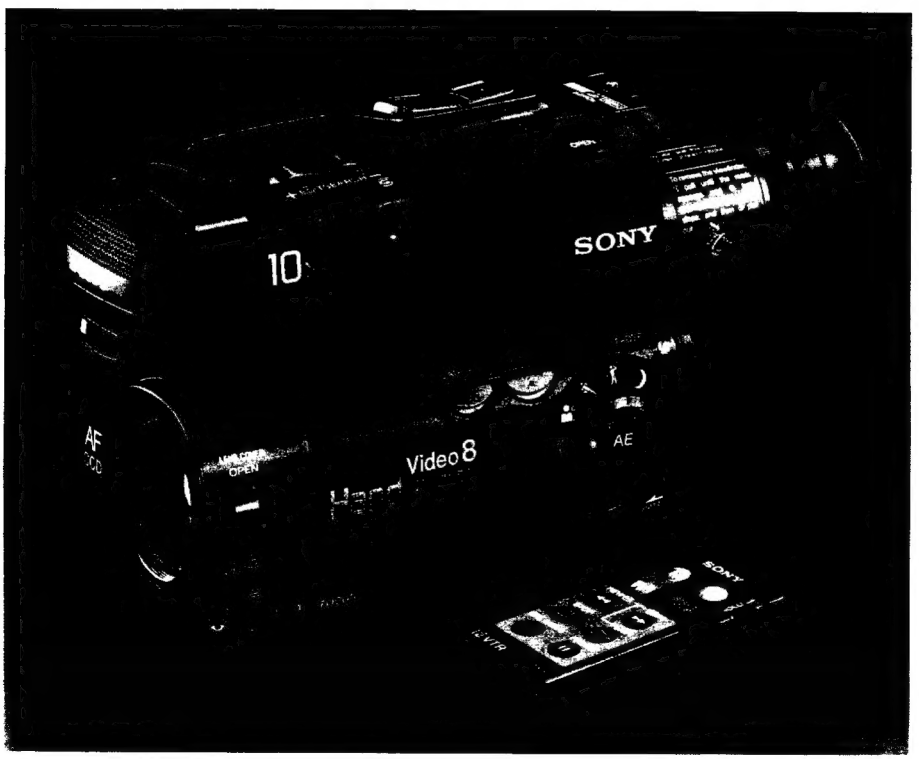
3-755-493-22 (1)

Video Camera Recorder 8

CCD-TR31

Operation Manual

Before operating the unit, please read this manual thoroughly and retain it for future reference.



Video8 Handycam

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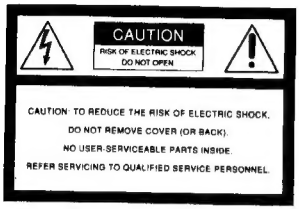
WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Information for the customers in the U.S.A.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Notice for the customers in Canada

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

Owner's Record

The model and serial numbers are located on the bottom of the camcorder. Record the serial number in the space provided on the right hand. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-TR31

Serial No. _ _ _ _

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Welcome to Video 8

Congratulations on your purchase of this Sony Handycam® camcorder. With your Handycam you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

About This Manual

This manual shows you how to operate your camcorder. To get the most out of the features of the Handycam, read this manual thoroughly before you use your camcorder. If you want to start shooting right away however, read the chapters, **Getting Started** and **Basic Operation** first. Once you are familiar with basic operations in these chapters, you may want to proceed to the chapter, **Advanced Operation.**

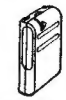
- As you read through this manual, buttons and settings on the camcorder are shown in capital letters:
  e. g. Slide the POWER switch to CAMERA.
- Use "Identifying the Parts" at the end of this manual as a guide to look for a functions and operations on the camcorder itself.

Note on TV Color Systems

TV color systems are different depending on the countries. If you view the playback picture on a TV, you need an NTSC system based TV or a PAL-M system based TV with NTSC/PAL-M transcoder (as this is an NTSC system based camcorder). Please check the list on page 45 to see the TV color system of your country.

Unpacking Your Camcorder

Check that the following accessories are supplied with your camcorder.

• Wireless Remote Commander (1)	• Remote Commander holder (1)	• Battery pack NP-55 (1) 
• AC power adaptor AC-V35 (1)	• Lithium battery CR2025 (2) (for camcorder/for the Remote Commander)	• RFU adaptor RFU-90UC (1)
• Shoulder strap (1)		

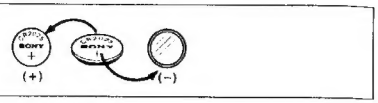
Before you start using your camcorder you need to:

1 Unpack your camcorder.
2 Insert the lithium battery.
3 Charge and install the battery pack.
4 Set the date and time.
5 Insert a tape.
6 Check the BEEP switch.
7 Adjust the viewfinder lens to your eyes.

This chapter takes you through these procedures step by step.

Inserting the Lithium Batteries

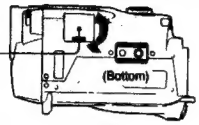
Your camcorder is supplied with two lithium batteries. One is for the camcorder, and the other is for the Remote Commander.
Well, the lithium battery has a positive (+) side and a negative (–) side as illustrated below. **Be sure to install the lithium battery with the positive side facing out.**



Inserting the Lithium Battery into the Camcorder

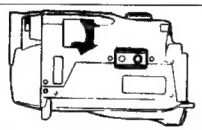
To activate the clock and the world clock, you must insert a lithium battery. Make sure you use one of the supplied lithium batteries.

1 **Detach the lid of the lithium battery compartment.**



2 **Install one of the supplied lithium batteries with the positive (+) side facing out.**

3 **Replace the lid.**



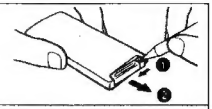
To change the lithium battery

Detach the lid of the lithium battery compartment, and replace the lithium battery with a new one.
When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, resetting of the date and time will be necessary.

Inserting the Lithium Battery into the Remote Commander

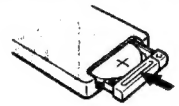
First, you have to insert the lithium battery into the Remote Commander. Use one of the supplied CR2025 lithium batteries.

1 **Pull out the lithium battery holder from the Remote Commander.**



2 **Insert the lithium battery with the positive (+) side facing upward.**

3 **Put the lithium battery holder back into the Remote Commander.**



To replace the lithium battery

Remove the lithium battery holder from the Remote Commander, and pull out the lithium battery, and insert a new one. **Replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

Lithium battery life

The battery for the camcorder lasts for about 1 year, and the battery for the Remote Commander lasts for about 6 months under normal operation. When the lithium battery becomes weak, the indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA.

In the viewfinder

WARNING

Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution

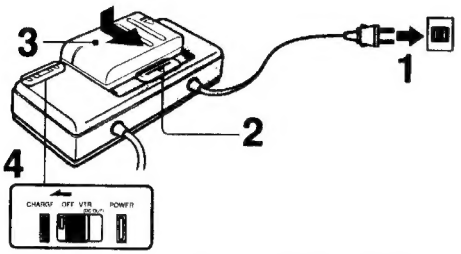
Keep the lithium battery out of the reach of children.
Should the battery be swallowed, consult a doctor immediately.

Charging and Installing the Battery Pack

Before you can use your camcorder, you first need to charge and install the battery pack.

Charging the Battery Pack

To charge the battery pack:



1	**Plug the AC power adaptor into a wall outlet.**
2	**Align the right side of the battery pack with the line on the AC power adaptor.**
3	**Push down and slide the battery pack in the direction of the arrow.**
4	**Set the selector to "CHARGE" position.**

When charging is finished, the charge lamp goes out.

Type of battery pack	NP-55 (supplied)	NP-77HD	NP-77H	NP-77	NP-66H	NP-55H
Required charging time	60	140	140	120	115	70
Battery life	60	140	140	120	115	70

(approx. minutes using AC-V35)

Important!

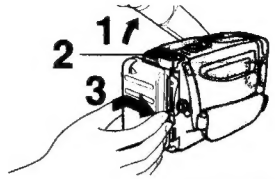
Use the battery completely before re-charging!

Before you recharge the battery, make sure the battery has been used (discharged) completely. Excessive charging may reduce the charging capacity of the battery.

To use up the battery, remove the cassette and slide the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ⊂⊃ indicator and a red lamp flash in the viewfinder.

Installing the Battery Pack

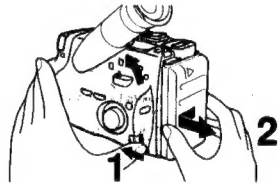
When you have finished charging the battery, install the battery pack as follows:



1	**Lift up the viewfinder.**
2	**Align the right side of the battery pack with the white line on the camcorder.**
3	**Slide the battery pack to the right.**

To remove the battery pack

Lift up the viewfinder, and press BATT in the direction of arrow (1) and, at the same time, slide out the battery pack to the left (2).



Remaining battery indicator

You can check the remaining battery capacity with the remaining battery indicator in the viewfinder. The decreasing white bar indicates decreasing battery power.

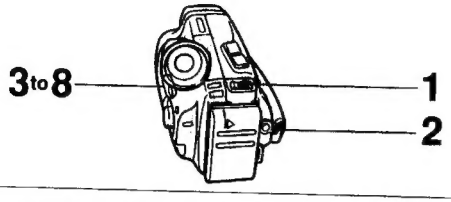
In the viewfinder

Note

The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the NP-77HD battery pack (not supplied). The indicator of NP-77HD is more accurate.

Setting the Date and Time

You need to set the camcorder's date and time to put the correct ones onto your video. Make sure that the power source and lithium battery are installed. Make settings looking at the viewfinder. About the world clock, see page 29.

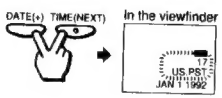


1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

2 **Turn the STANDBY switch up.**

3 **Press DATE (+) and TIME (NEXT) simultaneously for at least 2 seconds until the area name and number appear in the viewfinder.**

DATE now functions as + (to advance numbers) and TIME functions as NEXT (to set).



4 **Press DATE (+) to select your area name.**

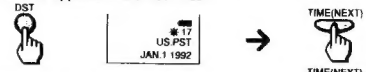
The time zones and area names are numbered as follows:

Time Zone	Area Name	Area Number
Hawaii Standard Time	HAWAII	15
Alaska Standard Time	ANCHRGE	16
Pacific Standard Time/West Canada	US. PST	17
Mountain Standard Time	US. MST	18
Central Standard Time	US. CST	19
Eastern Standard Time/East Canada	US. EST	20

5 **Choose one of the following options to set the clock:**

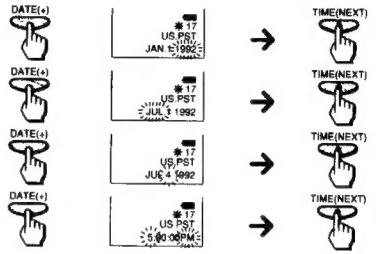
(a) For Daylight Savings Time, press DST. Then press TIME (NEXT).

The ✷ indicator appears in the viewfinder.



(b) For standard time, press TIME (NEXT).

6 **Adjust the flashing digits of the year, month, day and hour by pressing DATE (+) and TIME (NEXT).**



Note:
When you keep DATE (+) depressed, the digits advance faster.

7 **Adjust the flashing digits of minute by pressing DATE (+).**

8 **Press TIME (NEXT).**
The clock starts working.

To correct the date and time settings

Press TIME (NEXT) repeatedly until the minute digits stop flashing. Then repeat steps 3 to 8.

To check the preset date and time

Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

To reset to standard time

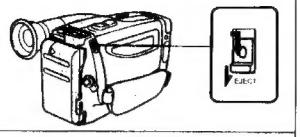
Press DST. The ✷ indicator goes off.

Inserting a Cassette

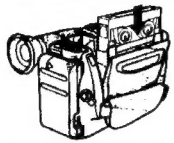
This section shows you how to insert a cassette.
Make sure that the power source is attached before you insert a cassette.

1 **While pressing the small blue button on the EJECT knob, slide it down.**

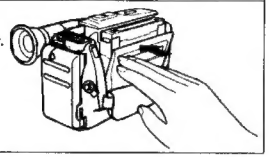
The cassette compartment automatically lifts up and opens toward you.



2 **Insert a tape with the window facing out.**

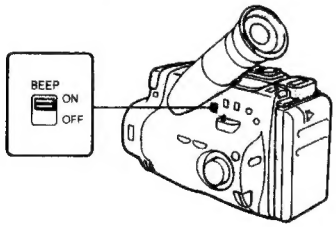


3 **Close the cassette holder by pressing the "PUSH" mark on the cassette holder.**



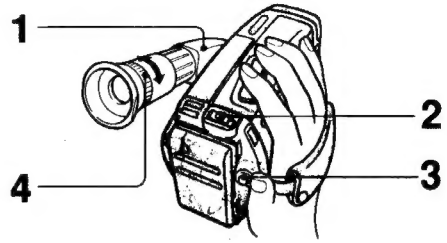
Checking the BEEP Switch

A beep sounds when you start recording and two beeps sound when you stop recording, confirming the operation.
Several beeps also sound as a warning of any unusual condition of the camcorder. Note that the beep sound is not recorded on the tape.
If you do not want to hear the beep sound, set the BEEP switch to OFF.

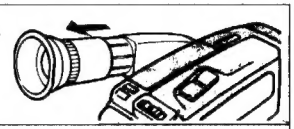


Adjusting the Viewfinder Lens

Before you use the camcorder for the first time (or after someone else has used it), adjust the viewfinder lens to best fit your eyesight. Make sure that the power source is attached to the camcorder, and a cassette is inserted.



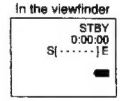
1 **Pull out the viewfinder until it clicks.**



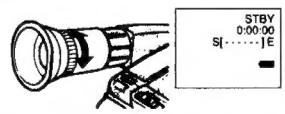
2 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

3 **Turn the STANDBY switch up.**

In the viewfinder

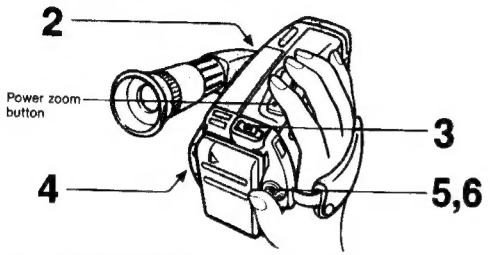


4 **Turn the viewfinder lens adjustment ring so that the "STBY" indicator in the viewfinder screen comes into sharp focus.**



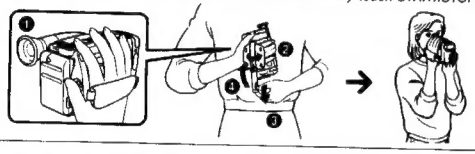
Camera Recording

This section describes the basic procedures for recording.
Make sure that the viewfinder is pulled out and a battery pack (see page 9) or other power sources (see page 24) are attached. If you set the date (page 10), the date is automatically recorded for 10 seconds after you start recording (Auto Date feature). This feature works only once a day.
If you set the BEEP switch to ON, beeps sound when you start/stop recording or when you make a mistake in operation.
Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working perfectly.



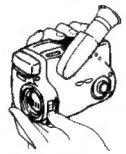
1 **Hold the camcorder as described below.**

Put your hand through the grip strap, hold your camcorder against your body and pull the strap upward. Check that your thumb can easily touch START/STOP.



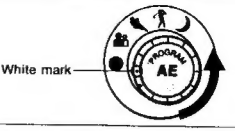
2 **Slide the LENS COVER switch to OPEN.**

Note that the camcorder doesn't start recording while the lens cover is closed.



3 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

4 **Set the white mark of the PROGRAM AE dial to the green position.**

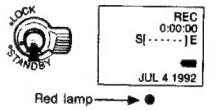


5 **Turn the STANDBY switch up.**

"STBY", the remaining tape length and remaining battery indicators appear in the viewfinder. Now you can see through the viewfinder.

6 **Press START/STOP once.**

The camcorder is recording when the "REC" indicator appears and the red lamp lights up in the viewfinder.



In the viewfinder, you can see a black and white picture of what you are recording and information that indicates what the camcorder is doing.

To stop recording momentarily

Press START/STOP again.
"STBY" indicator appears in the viewfinder.

To finish recording

Turn STANDBY down and slide the POWER switch to OFF. Close the lens cover.

Ejecting the tape

1 While pressing the small blue button on the EJECT knob, slide the knob down.
2 Take out the tape.
3 Close the cassette holder by pressing the "PUSH" mark on the cassette holder.

To reset the counter to 0:00:00

Press COUNTER RESET.

To check the remaining tape length during recording

In recording mode, the remaining tape length indicator appears in the viewfinder. The remaining tape length indicator changes as follows.

When you shoot a subject within 80 cm (31 1/2 inches) of the lens using telephoto zoom

If you cannot get a sharp focus while in extreme telephoto zoom, press the W side of the power zoom button until the focus becomes sharp.

Note on the auto date feature

The auto date feature works once a day. However, the date may automatically appear more than once a day when:
- you reset the date and time.
- you eject and insert the tape again.
- you stop recording within 10 seconds.

Near the end of the tape

The ⊏⊐ indicator, the red lamp in the viewfinder, and the camera recording/battery lamp on the camcorder flash slowly. When the tape reaches the end, the flashing becomes rapid.

Caution!

Please remember that you can only use 8 mm format video cassettes with this camcorder, and that it is not possible to use PCM recording/playback function available on some 8 mm recorders. The PCM sound recorded or after-recoded with another recorder cannot be played back with this camcorder.
You can record tapes in SP (standard play) mode only, and play back tapes in both SP and LP (long play) modes.

If you wear glasses

You can bend back the eyecup to get a better view of the viewfider.

Notes on recording

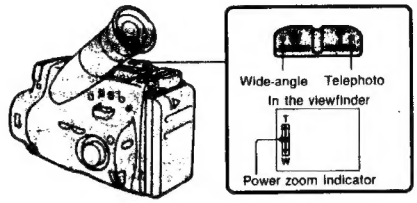
- When you record from the beginning of the tape, run the tape for about 15 seconds before the actual recording. This will ensure that you won't miss any start up scenes when the tape is played back.
- When moving from indoors to outdoors, or vice versa, turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

If you leave the camcorder in standby mode for 5 minutes or more

The camcorder goes off automatically. To re-enter standby mode, turn the STANDBY switch down once and turn it up again. To start recording, press START/STOP directly.

Using the Zooming Feature

Zooming is a recording technique that lets you change the size of the subject in the scene. Use "Zoom-in (telephoto)" for dramatic close-ups, and "zoom-out (wide-angle)" for panoramic long shots. You can also use zooming to focus manually or to decide on a shooting angle. For more professional-looking recordings, use zooming sparingly.



Dual Speed Zooming

The camcorder's power zoom button offers dual speed zooming. Press it firmly for high speed zooming and softly for relatively slow zooming.
Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

Close-up (Macro)

Even small subjects such as flowers, insects, and images in photographs, can literally fill the screen using autofocus in macro.

1 Bring the camcorder as close as necessary to obtain the desired subject size.
2 Press the W side of the power zoom button until the indicator in the viewfinder stops at the W end.

Manual focusing in Macro

You can also shoot with manual focus while doing close-up.
For details of manual focusing, see page 31.

Note

You can shoot a subject that is at least 80 cm (about 31 1/2 inches) away from the lens surface in the telephoto position.

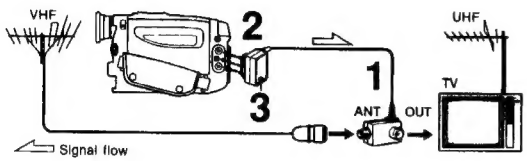
Playing Back a Tape

You can use this camcorder to function as a VCR by connecting it directly to your TV for playback.

There are several ways to connect the camcorder to your TV. First check if your TV has video/audio inputs. If it does, see page 35. You can also monitor the playback picture in the viewfinder while the camcorder is connected to your TV.

If Your TV Has Only an Antenna Input

Use the supplied RFU adaptor to connect your camcorder to the TV. Make sure that the TV is turned off to prevent speaker damage before hooking up to your camcorder.



To connect your camcorder to a TV that already has a regular TV (VHF) antenna attached, you need to:

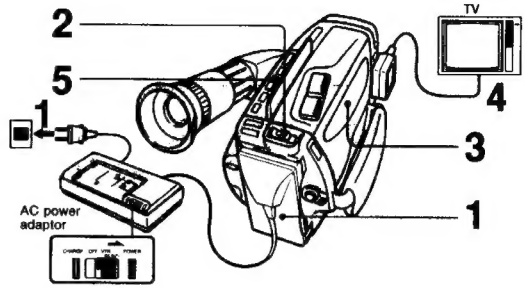
1 **Unplug the antenna cable from the TV.**

Plug in the end of the RFU adaptor marked OUT into the antenna input of your TV. Re-wire the antenna cable you unplugged to the RFU adaptor jack marked ANT. This way, you can switch between TV broadcasts and your home video playback without re-wiring.

2 **Connect the RFU adaptor to the camcorder.**

3 **Set the channel selector on the RFU adaptor (and your TV channel) to 3CH or 4CH of the VHF channel, whichever is not active (vacant) in your area.**

Playing Back a Tape



1 **Attach the connecting plate of the AC power adaptor to the camcorder and connect the AC power adaptor to a wall outlet.**

Then set the selector to "VTR (DC OUT)" position.

2 **While pressing the small green button on the POWER switch, slide it to PLAYER.**

3 **Insert a tape.**

4 **Set the TV/VCR selector on the TV to VCR.**

5 **Press ▷ (PLAY).**
Playback starts.

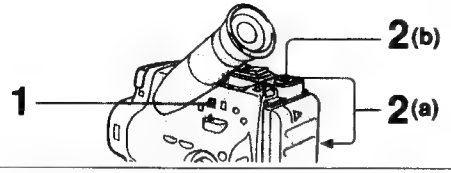
To stop playback, press □ (STOP).
To rewind the tape, press ◀◀ (REW).
To fast forward the tape, press ▶▶ (FF).

When you have finished playback

1 Slide the POWER switch to OFF.
2 Disconnect the AC power adaptor from the wall outlet.

Using the Remote Commander

You can use the Remote Commander to record yourself with your friends or family, or conveniently control the playback of your tape from a distance. Before you use the Remote Commander, insert a supplied lithium battery into it (see page 7) and turn on the POWER switch on the camcorder.

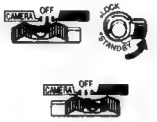


1 **Set the REMOTE COMMANDER ON/OFF switch on the camcorder to ON.**

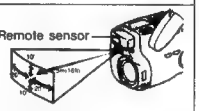
2 **Set the POWER switch on the camcorder as follows:**

(a) When recording, 1) while pressing the small green button on the POWER switch, slide it to CAMERA, 2) turn STANDBY up.

(b) When playing back, while pressing the small green button on the POWER switch, slide it to PLAYER.



3 **Aim the Remote Commander at the remote sensor on the camcorder and press the appropriate button on the Remote Commander.**



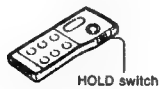
(Maximum distance and angle for remote control)

Note

The buttons that have the same name on the Remote Commander and on the camcorder function equally.

To prevent misoperation

When you slide the HOLD switch in the direction of the arrow, none of the buttons on the Remote Commander will work. Use this to prevent any misoperation, such as accidentally pressing a button.



Notes on the Remote Commander operation

- Make sure that the remote sensor is not in sunlight or strong light. In that case, you may not be able to operate with the Remote Commander.
- This camcorder works through the signals of the commander mode "VTR 2". A commander mode is used to distinguish this camcorder from other Sony VCRs to avoid misoperation. If you use another Sony VCR at commander mode "VTR2", we recommand you change the commander mode or cover the remote sensor of the VCR with black paper.
- Be sure that there are no obstructions between the Remote Commander and the camcorder.

Using the Remote Commander holder

You can clip the Remote Commander holder on your coat pocket or belt, or slide it onto the shoulder belt before attaching the Remote Commander to it.

To remove the Remote Commander from the holder

To attach the holder to the shoulder belt

Getting the Most out of Your Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

Always carry additional batteries

Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.
"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at a room temperature using a fully-charged battery.

Battery life is shorter in cold environment

Battery efficiency is decreased and the battery will be used up more quickly if you are recording in cold environment.

To save battery power

Turn the STANDBY switch on the camcorder down when not recording to save battery power. A smooth transition between scenes can be made even if recording is stopped and started again.

While positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used.
The battery is also used when a tape is inserted or removed.

When to Replace the Battery Pack

While you are using your camcorder, the remaining battery ▬ indicator decreases gradually as battery power is used up. When the remaining battery indicator reaches the lowest point, the ⌧ indicator appears and starts flashing in the viewfiner.
When the ⌧ indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, slide the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain smooth transition between scenes after the battery pack is replaced.

Notes on the Rechargeable Battery Pack

The battery heats up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack.
This is not cause for concern.

Battery care

- Remove the battery pack from the camcorder after using the battery pack, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF, which shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery right before using the camcorder.

How to use the switch on the battery pack

This switch is provided so that you can mark the charged battery. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself).

The life of the battery pack

The battery pack can be fully charged and discharged about 500 times under normal temperatures. If the battery ⌧ indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging temperature

You should charge batteries at temperatures from 10 °C to 30 °C (from 50 °F to 85 °F). Lower temperatures require a longer charging time.

Notes on Charging

A brand-new battery

A brand-new battery pack is not charged. Before using the battery pack, charge it sufficiently.

Before recharging a used battery pack

- Make sure to use up the battery before recharging.
- If recording is completed before the ⌧ indicator appears in the viewfinder, you should remove the tape, slide the POWER switch to CAMERA, turn up the STANDBY switch, and leave the camcorder until the battery indicator flashes rapidly.
- When you use the AC-S10 power adaptor, the DC-S10 car battery charger or BC-S10 portable battery charger, you can use the discharging function.
- **Charging the usable battery causes a lowering of battery capacity. Battery capacity can be recovered if you fully discharge and charge the battery again.**

After long storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Note on the Terminals

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, repeat installing and removing the battery pack. This improves the contact condition. Also, wipe the + and − terminals with a soft cloth or paper.

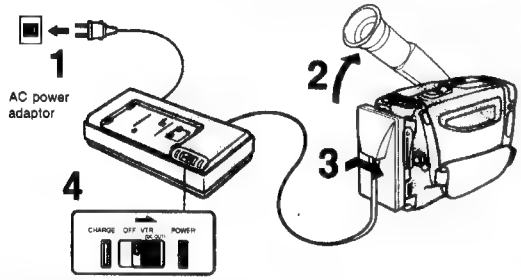
Using Alternative Power Sources

This section describes alternative power sources you can use for your camcorder: battery pack (see page 8), house current, and 12/24 V car battery.
Choose the appropriate power source depending on where you want to use your camcorder.

Place	Power source	Accessory to be used
Indoors	House current	AC power adaptor AC-V35 (supplied), AC-S10, AC-V55
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77HD, NP-77H, NP-77, NP-66H, NP-55H
In the car	12 V or 24 V car battery	DC pack DCP-77

Using House Current

To use the supplied AC-V35 AC power adaptor:

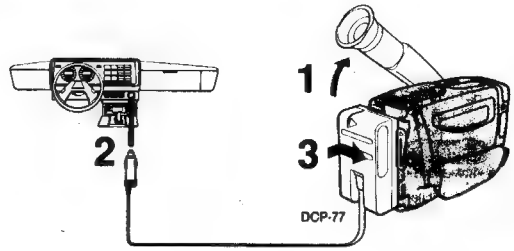


1 Connect the AC power adaptor to a wall outlet.
2 Lift up the viewfinder.
3 Align the right side of the connecting plate with the white line on the camcorder, and slide it to the right.
4 Set the selector to "VTR (DC OUT)" position.

To remove the connecting plate
The connecting plate is removed in the same way as the battery pack. See page 9.

Using a Car Battery

To use the DCP-77 DC pack (not supplied):



1 Lift up the viewfinder.
2 Connect the cord of the DC pack to the cigarette lighter socket of the car (12 V or 24 V).
3 Align the right side of the DC pack with the white line on the camcorder, and slide it to the right.

To remove the DC pack
The connecting plate is removed in the same way as the battery pack. See page 9.

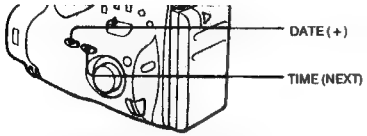
Options for Charging the Battery Pack

- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has discharging function.
- BC-55, BC-77 or BC-S10 portable battery charger (ideal for travel):
  You can charge a battery pack on 100 – 240 V AC current.

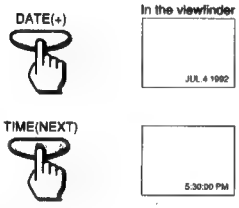
Camera Recording

In the "Chapter 2 Basic Operation", you learned the basic recording operations. This section shows you how to record the date or time, re-record a picture, prevent accidental erasure, and more.

Recording the Date or Time



While you are recording or when the camcorder is in recording standby, press DATE (+) for the date indicator or TIME (NEXT) for the time indicator. The date or time displayed in the viewfinder is recorded with the picture.

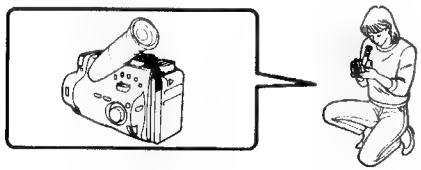


To stop recording with the date and time

Press DATE (+) or TIME (NEXT) again. The date or time indicator disappears. The picture recording continues.

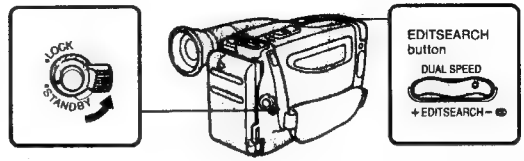
Recording in a Low-position

You can also record in a low position to get an interesting recording angle.
When the viewfinder is pushed down, you can monitor the picture without being close to the viewfinder.
Adjust the viewfinder barrel. (You can rotate it up to 90 degrees.)



Checking the Recorded Picture in the Viewfinder (EDITSEARCH)

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.
After checking your recorded picture, you can also re-record over a previously recorded portion.



Reviewing the last recorded scene—Rec Review

You can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks.

1 Set the camcorder in standby mode by turning STANDBY up.
2 Press the – (⏪) side of EDITSEARCH momentarily.

The last few seconds of the recorded portion are played back in the viewfinder. Then the camcorder goes back to standby mode, ready for the next recording.

Checking your recorded picture

You can check the recorded picture in the viewfinder. After checking, you can also re-record over previously recorded portion.

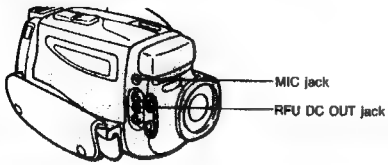
1 Set the camcorder in standby mode by turning STANDBY up.
2 Keep pressing the + side or – side of EDITSEARCH to play back the picture while looking in the viewfinder.
+ side: to view the forward playback picture
– side: to view the reverse playback picture
Press EDITSEARCH softly to transport the tape at normal speed or firmly to transport the tape at high speed.
To stop playback, release EDITSEARCH.
3 To re-record over a recorded portion:
● Press the + side or – side of EDITSEARCH to locate the point you want to begin re-recording.
● Press START/STOP to begin re-recording.
Re-recording begins from the point you released EDITSEARCH. As long as you do not eject the tape, the transition between the scenes will be smooth.

Dual speed EDITSEARCH button

The camcorder's EDITSEARCH button offers dual speed transport of the tape.
Press it softly to transport the tape at normal speed (◀ or ▶ appears in the viewfinder), or firmly to transport the tape at high speed (⏪ or ⏩ appears in the viewfinder).

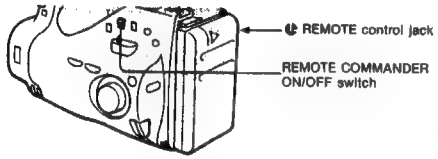
Recording with an External Microphone

You can connect an external microphone (monaural, not supplied) to the MIC jack. This jack also accepts a "plug-in-power" microphone.



Connecting a Wired Remote Control Unit

When you connect a wired remote control unit (not supplied) or editing controller (not supplied) to the REMOTE control jack on the camcorder, you can operate your camcorder from a distance. In this case, be sure to set the REMOTE COMMANDER ON/OFF switch of the camcorder to OFF.

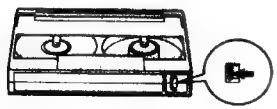


About (LANC)

stands for Local Application Control Bus System. The control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.

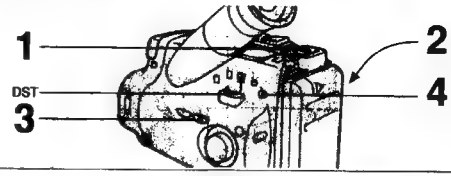
Preventing Accidental Erasure

To prevent accidental erasure, slide the tab on the cassette to expose the red mark. If you try to record with the red mark exposed, the and indicators flash in the viewfinder, and you cannot record. To re-record on this tape, slide the tab back out covering the red mark.



Using the World Clock

You can reset the clock according to your time zone only by pressing the AREA button. Before using the world clock, set the date and time (see page 10).



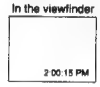
1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

2 **Turn STANDBY up.**

3 **Press TIME (NEXT).**

The "date and time settings" appear.

In the viewfinder



4 **Press AREA until your time zone's name and number appear.**

An area name appears in the viewfinder. You can find the area name and the number in the "Time zone chart" on the next page.

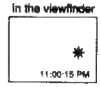
To check the date

Press DATE (+).
To turn off the date indicator, press DATE (+) again.

To adjust to daylight savings time

Press DST.
The time changes to daylight savings time.
To reset to standard time, press DST again.

In the viewfinder

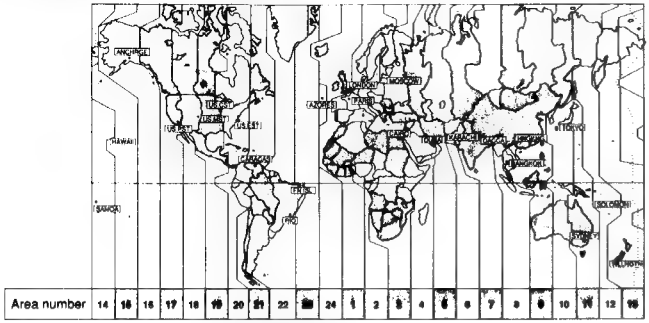


To re-set to your home area time again

Press AREA until your home area name appears.

Using the World Clock

Time zone chart



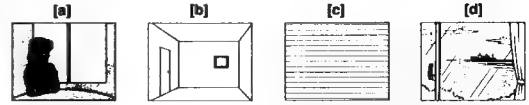
Area number	Area name	Nations or area*
1	LONDON	England, GMT (Greenwich Mean Time), Portugal
2	PARIS	Austria, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland
3	CAIRO	Egypt, Greece, Israel, Turkey
4	MOSCOW	Iraq, Kenya, Saudi Arabia, former Soviet Union (west)
5	DUBAI	United Arab Emirates
6	KARACHI	Moldives, Pakistan
7	DACCA	Bangladesh, India, Myanmar
8	BANGKOK	Cambodia, Indonesia (Jakarta), Thailand, Vietnam
9	HNGKNG	Australia (west), China, Hong Kong, Indonesia (Bali, Borneo), Malaysia, Philippines, Singapore, Taiwan
10	TOKYO	Japan, Korea
11	SYDNEY	Australia (east), Guam, Saipan
12	SOLOMON	New Caledonia
13	WLLNGTN	Fiji, New Zealand
14	SAMOA	Western Samoa
15	HAWAII	HST (Hawaii standard time), Tahiti
16	ANCHRGE	AST (Alaska standard time)
17	US. PST	PST (Pacific standard time)
18	US. MST	MST (Mountain standard time)
19	US. CST	CST (Central standard time), Mexico
20	US. EST	EST (East standard time), Peru
21	CARACAS	Chile, Venezuela
22	RIO	Argentina, Brazil
23	FN ISL.	Fernando de Noronha
24	AZORES	Azores Islands

* These are common names. They may be different from formal country names.

Focusing Manually

When to use manual focus

In the following cases you should obtain better results by adjusting the focus manually.

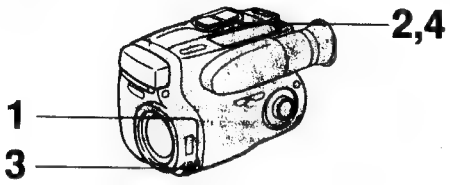


[a] to [d] correspond to the illustrations above.

- Too much brightness behind the subject [a]
- Subjects with little contrast – walls, sky, etc. [b]
- Horizontal stripes [c]
- Subject through frosted glass [d]
- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder
- Bright subject or subject reflecting light
- High contrast behind the subject (the background may be focused)
- When using conversion lenses or effect filters
- When shooting a stationary subject using tripod
- When you want to save battery power

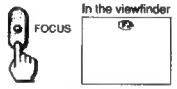
Focusing Manually

When adjusting the focus manually, the best way is to first adjust at telephoto position before recording, then set the desired zoom angle.



1 **Press FOCUS.**

The (manual focusing) indicator appears in the viewfinder.



2 **Keep pressing the T (telephoto) side of the power zoom button until the zooming stops.**

3 **Turn the focus dial to achieve sharp focus.**

The focus dial does not have a stop position.

4 **Set the desired shot length using the power zoom button.**

To reactivate autofocusing

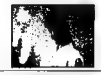
Press FOCUS until the indicator in the viewfinder disappears.

Shooting in relatively dark places

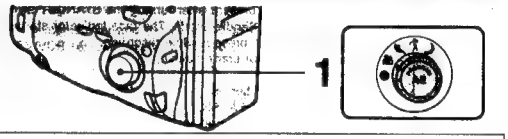
When shooting in relatively dark places such as indoors, the depth of field (distance range of the subject that will be in sharp focus) is very shallow. For best results, shoot at wide angle after focusing in the telephoto position.

When you use the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (the object is in focus and the background is out of focus), or capture high-speed action with "sports" mode or "high speed shutter" mode. When you record fireworks or neon signs, use "twilight" mode. Select from four types of mode referring to the following table.

To choose the best programmed AE mode

When shooting:	Select:
• A still subject such as a person or a flower • Zooming in a subject in the telephoto mode • A subject behind such obstacle as a net	(Portrait mode) In the viewfinder 
• Outdoor sports scene such as football, tennis or golf • A landscape in a moving car	(Sports mode)
• A golf swing or a tennis match with the tennis ball captured clearly • Playing back certain scenes with high speed movements in a clear, sharp picture	(High speed shutter mode)
• Recording a night view, neon signs, or fireworks	(Twilight mode)

Selecting the PROGRAM AE Mode



1 **Set the white mark of the PROGRAM AE dial to the desired PROGRAM AE mode.**
The indicator of the selected PROGRAM AE mode appears in the viewfinder.
As you turn the dial, the indicator changes as follows:

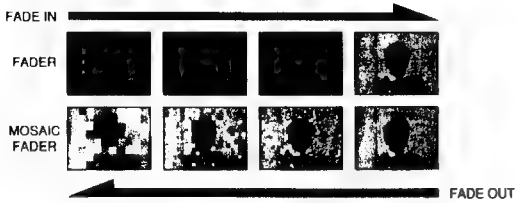
No indicator ↔ (Portrait mode) ↔ (Sports mode) ↔ (High-speed shutter mode) ↔ (Twilight mode)

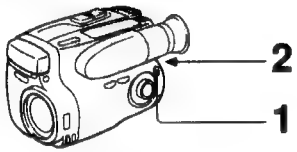
Note

The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode – between 1/60 to 1/2000
Sports mode – between 1/60 to 1/500
High-speed shutter mode – 1/4000
Twilight mode – 1/60

Fade-in and Fade-out

You can fade a picture in or out with sound to give your recording a professional touch. When fading-in, you can make the picture gradually appear from black or mosaic while increasing the sound. When fading-out, you can make the picture gradually fade to black or mosaic while decreasing the sound.



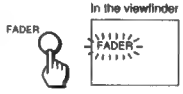


1 **Select the type of fade by pressing FADER as follows:**

(a) When fading-in, press it after turning the STANDBY switch up to put the camcorder into standby mode. The fade indicator starts flashing.
(b) When fading-out, press it while recording.
The fade indicator starts flashing.

Note on the FADER button
Each time you press FADER, the indicator changes as follows:

No indicator → FADER (black fade)
↑ ↓
M. FADER (mosaic fade)



2 **Press START/STOP.**

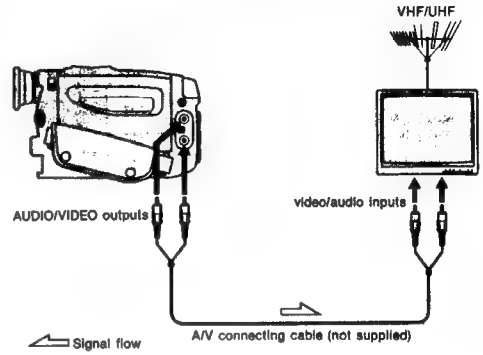
When fading-in, the fade indicator stops flashing and the recording starts fading in.
When fading-out, the fade indicator stops flashing, the picture fades out, and then recording stops.

To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER so that the fade indicator disappears.

Playing Back a Tape

This section describes several other methods to connect your camcorder to your TV depending on the type of TV you have in order to play back a picture on TV.
To connect a TV that does not have video/audio inputs, see page 18.

Connecting a TV with Video/Audio Inputs

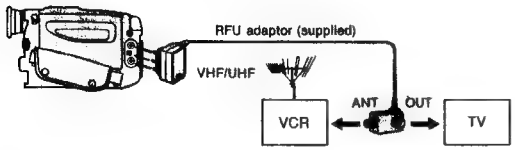


1 Connect the camcorder and the TV using an A/V connecting cable (not supplied).
2 Set the TV/VCR selector on the TV to VCR.

Connecting to a TV via a VCR

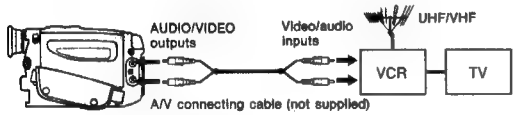
You can connect the camcorder to a TV via a VCR.

When your TV is without video/audio inputs



1 Disconnect the antenna connection between the TV and the VCR, and connect the RFU adaptor (supplied) to the VHF/UHF input on the TV and VHF/UHF output on the VCR.

When your TV has video/audio inputs



1 Connect the camcorder to the VCR using an A/V connecting cable (not supplied).
2 Set the TV/VCR selector on the TV to VCR.

Various Playback Modes

Still picture (playback pause)

To view a still picture, press ❚❚ during playback.
❚❚ appears in the viewfinder.
To resume normal playback, press ▷ or ❚❚.

Note

When still picture mode lasts for 5 minutes or more, the camcorder automatically stops.

High-speed search (picture search)

To monitor a picture in high speed and locate a desired scene quickly, keep pressing ◀◀ or ▶▶ during playback.
To resume normal playback, release the button.

High-speed search during fast forward or rewind (skip scan)

You can also go into high-speed search during fast foward or rewind to locate a desired scene more quickly. Press ◀◀ while rewinding or ▶▶ while advancing the tape.
To resume normal playback, press ▷.

Note on various playback modes

During various playback modes, streaks appear and the sound is muted.

In playback pause mode

You can view the picture in a sequence of stop-motoin images by pressing EDITSEARCH. If you keep pressing EDITSEARCH, you can view the picture playback in forward or reverse direction.

Displaying the viewfinder screen indicators on the TV

Press the DATA SCREEN button on the Remote Commander.
You can only use this function with the Remote Commander.

The indicator in the viewfinder screen is superimposed on the TV screen.
To clear the indicator, press the DATA SCREEN button again.

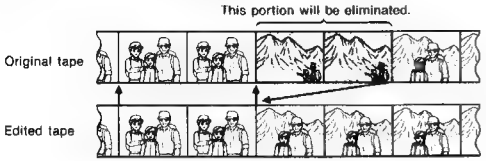
To check the remaining time of the tape during playback

In playback mode, the remaining tape length indicator appears in the viewfinder. The remaining tape length indicator changes as follows.

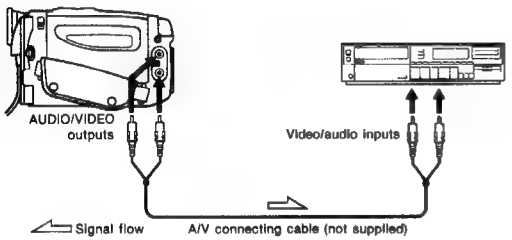
Editing

Editing Tapes with a VCR

You can create your own video program by editing with any other 8 8mm, β Betamax, or VHS VHS VCR that has video/audio inputs.

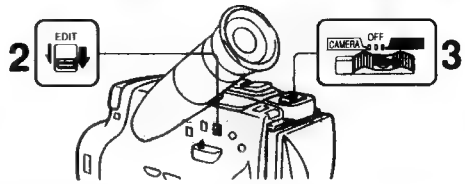


Connection



1 Connect the camcorder and the VCR using an A/V connecting cable (not supplied).
2 Set the input selector on the VCR to LINE, if available.

How to edit



1 Insert a tape to be recorded into the recording VCR.
2 Slide EDIT on the camcorder in the direction of the arrow.
3 While pressing the small green button on the POWER switch, slide it to PLAYER.
4 Insert your recorded tape into the camcorder.
5 Play back the tape on the camcorder until you locate the point where you want to start editing, then set the camcorder to the playback pause mode.
6 On the recording VCR, locate the recording start point and set the VCR to the recording pause mode.
7 Press II PAUSE on the camcorder and VCR simultaneously to start editing.

To edit more scenes
Repeat steps 5 to 7.

To stop editing momentarily
Press II on the recording VCR.

To stop editing
Press □ on both the camcorder and the VCR.

Use of the EDITSEARCH button
You can play back the tape in normal/reverse direction by keep pressing EDITSEARCH during standby or playback pause. You can also play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Use of the EDIT switch
When you slide EDIT in the direction of the arrow (EDIT ON), you can keep picture deteriorations resulting from editing to a minimum. However, when you edit or copy to another VCR, avoid using the edited tape for multiple generations of editing.
After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Note on DATA SCREEN function
If you have displayed the viewfinder screen indicators on the TV (DATA SCREEN function), erase the indicators by pressing DATA SCREEN on the Remote Commander so that they will not be superimposed on the edited tape.

Playback Modes

The playback mode (SP or LP) is selected automatically according to the format in which the tape has been recorded. The quality of the recorded picture in LP mode, however, will not be as good as that in SP mode.

Foreign 8mm video

You may not be able to play back foreign pre-recorded software because of the difference in the TV color systems.

LP mode

When you play back the tape recorded in LP (long play) mode, LP indicator lights up in the viewfinder. This camcorder cannot record a tape in LP mode.

Maintenance Information

This section shows you how to maintain the camcorder.

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens.
In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

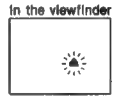
Inside the camcorder

If moisture condenses inside the camcorder, the 💧 indicator in the viewfinder flashes. When the cassette is inserted, the ⏏ indicator also flashes.

If this happens, no other functions except for tape ejection will work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least one hour in a dry place.
The camcorder can be used again if the 💧 indicator does not appear when the power is turned on again.

On the surface of the tape

When the cassette is inserted and a tape transport button (▷, ▶▶, etc.) is pressed, the ⏏ indicator in the viewfinder flashes.



In such case, no other function than tape ejection will work. **Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least one hour in a dry place.**
The camcorder can be used again if the ⏏ indicator does not appear when you insert the cassette and press one of the tape transport buttons.

On the lens

If moisture condenses on the lens, no indicator appears, but the picture becomes dim. Turn off the power and do not use the camcorder for about one hour.

How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

1 Be sure to tightly seal the plastic bag containing the camcorder.
2 Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

Video Head Cleaning

To ensure clear pictures, clean the video heads periodically.
When playback pictures are noisy or hardly visible, the video heads may be contaminated.

Slight contamination ⟶ Critical contamination

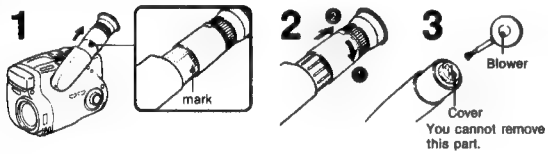
If this happens:
1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied).
2 After cleaning, check to see if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat the cleaning. (Do not repeat cleaning more than 5 times.)

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Caution

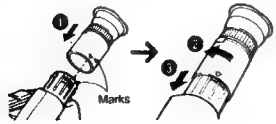
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Removing Dust from inside the Viewfinder



1 Pull out the viewfinder barrel until the illustrated mark appears.
2 Turn the viewfinder counterclockwise until it stops (●), and pull it out (●).
3 Clean the surface of the cover with a commercially available blower.

To reattach the viewfinder barrel
Align the ◁ mark on the viewfinder barrel with the ▷ mark on the viewfinder and push in the viewfinder barrel until it clicks (●). Then turn it clockwise until it stops (●) and push it in (●).



Tips for Better Camera Recording

This section shows you some hints for better shooting.

Achieving Better Camera Recording

You can get better pictures following the hints below.

How to hold the camera steadily
For hand-held shots, it is important to hold the camcorder properly.
- Hold the camcorder firmly and secure it with the grip strap ■■ that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Stand opposite the subject and let your feet take ■ comfortable stance.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on ■ table top or any other flat surface of suitable height.

Caution
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm (9/32 inches). Otherwise, the screw may damage the inner part of the camcorder.

Keep the horizontal plane level
You can easily determine the horizontal plane by using the viewfinder frame as a reference.

Use the video light in the dark
To get the best colors, you must maintain a sufficient light level. When using a video light, attach it to this camcorder with a video light attachment (not supplied).

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not pick up the camcorder by the viewfinder as shown in the left illustration.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the LENS COVER switch set to CLOSE when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder.**
  When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.
- **Do not let the camcorder get wet.**
  Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On handling tapes

- Do not insert anything in the small holes on the rear of the cassette. These holes are used to sense the type, thickness of tape, or if the tab is out or in, etc.

On care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

On copyright

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Using Your Camcorder Abroad

Each country has its own electricity and TV color systems. Before using your camcorder abroad, check the following points.

Power sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz. If you cannot attach the power adaptor to the wall outlet, use a power cord plug adaptor (not supplied).

To view the playback picture

This camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV or a PAL-M system based TV with NTSC/PAL-M transcoder. Check the following alphabetical list.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Former West Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

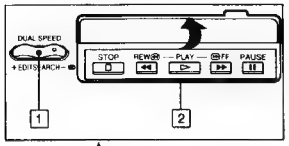
SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, Former Soviet Union, etc.

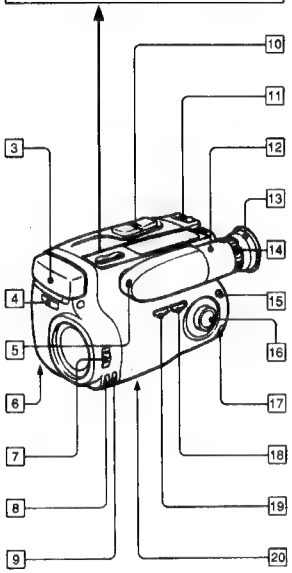
Notes on the supplied RFU adaptor

You can use the supplied RFU adaptor only in the country where you bought this camcorder. Since each country has its own electricity system and TV color system, you may not be able to use the RFU adaptor when you use the camcorder abroad.

World clock

You can use the world clock function abroad.
For details, see page 29.





For details on the use of each part, refer to the pages indicated in the parenthesis.

1 EDITSEARCH button (27)

2 Tape transport buttons (19), (37)
- □ STOP (stop)
- ◀◀ REW (rewind)
- ▷ PLAY (palyback)
- ▶▶ FF (fast forward)
- ❚❚ PAUSE (pause)

3 Built-in microphone (monaural)

4 Remote sensor (20)

5 Camera recording/battery lamp (16)

6 Hook for shoulder strap

7 LENS COVER switch (14)

8 Focus dial (32)

9 FOCUS button (32)

10 Power zoom button (17), (32)

11 POWER switch

12 Viewfinder (13)

13 Eyecup

14 Viewfinder lens adjustment ring (13)

15 FADER button (34)

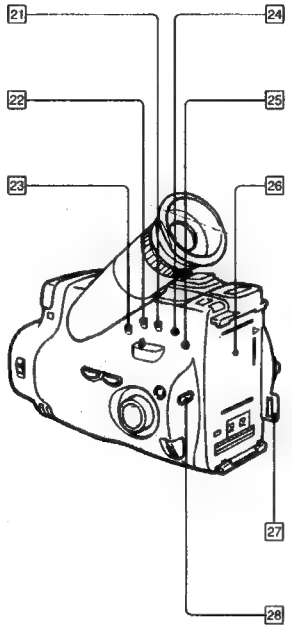
16 PROGRAM AE dial (33)

17 BATT (battery eject) knob (9)

18 TIME (NEXT) button (10), (26), (29)

19 DATE (+) button (10), (26), (29)

20 Lithium battery compartment (6)



21 EDIT switch (39)

22 REMOTE COMMANDER ON/OFF switch (20)

23 BEEP switch (12)

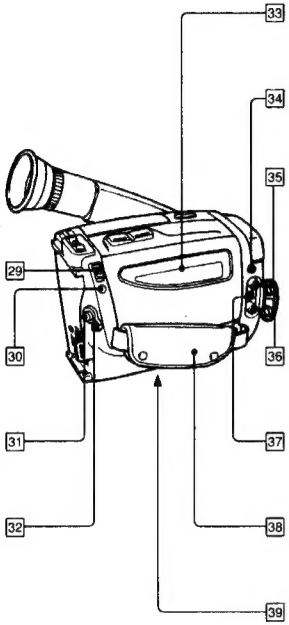
24 DST (daylight saving time) button (11)

25 AREA button (29)

26 Battery mounting surface (9)

27 Hook for shoulder strap

28 COUNTER RESET button (15)



29 EJECT button (12)

30 remote control jack (stereo mini-minijack)

31 START/STOP button (15)

32 STANDBY switch (13), (15)

33 Cassette compartment (12)

34 MIC jack (PLUG IN POWER) (monaural minijack) (28)

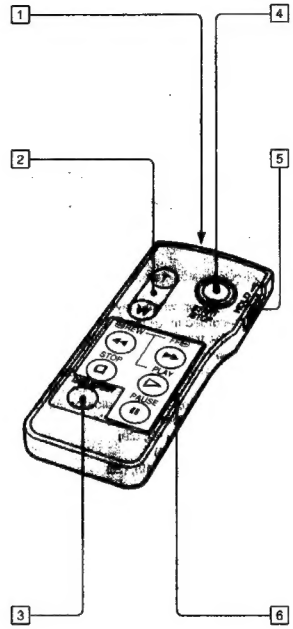
35 Jack cover

36 VIDEO/AUDIO output jacks (phono jack) (35)

37 RFU DC OUT (DC output) jack (18)

38 Grip strap cover

39 Tripod receptacle



Remote Commander

1 Transmitter

2 Power zoom button (17), (32)

3 DATA SCREEN button (37)

4 START/STOP button

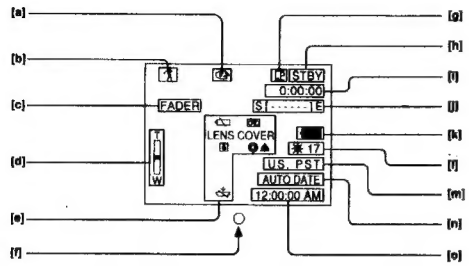
5 HOLD switch (20)

6 Tape transport buttons (19), (37)
◀◀ REW (rewind) button
▶▶ FF (fast forward) button
□ STOP button
▷ PLAY (playback) button
❚❚ PAUSE button

Indicators in the Viewfinder

Operation Indicators

For details on each indicator, refer to the pages idicated in the parenthesis.



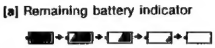
[a] Manual focusing ( ) (32)
[b] PROGRAM AE indicator (33)
[c] FADER has been pressed. (34)
[d] Power zoom indicator (17)
[e] Warning indicators (51)
[f] Lights up during recording.
When flashing: "Change battery or cassette"
[g] Lights up when playing back a tape recorded in LP mode (40)
[h] Tape transport mode (15), (19), (37)
[i] Tape counter
[j] Remaining tape length indicator (15), (37)
[k] Remaining battery indicator (9), (51)
[l] Area number (10), (29)
[m] Area name (10), (29)
[n] Auto date (15)
[o] Date or Time (10), (26)

Warning Indicators

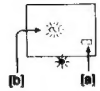
If indicators flash in the viewfinder or a caution lamp on the camcorder flashes, check the following:

In the viewfinder

[a] Remaining battery indicator



[b] Battery lamp
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.



The tape is near the end.

The tape has run out.

No tape has been inserted.

The tab on the tape is out (red).

Moisture condensation has occurred.

The video heads may be contaminated.

Some other trouble has occured.
Disconnect the power source and contact your Sony dealer or local authorized facility.

The lithium battery is weak.

The LENS COVER switch is set to CLOSE.

Trouble Check

If you run into any problem using the camcorder, use the following table to troubleshoot the problem. Should the difficulty persist, disconnect the power source and contact your Sony dealer or local authorized Sony service facility.

	Symptom	Cause	Corrective Actions Refer to the pages indicated on the right.	page
Power	The power is not on.	The battery is not attached.	Attach the battery.	9
		The battery is dead.	Use a charged battery.	8
		The AC power adaptor is not connected to a wall outlet.	Connect the AC power adaptor to a wall outlet.	24
	The power goes off.	While being operated in CAMERA mode, the camcorder has been in the pause mode for more than 5 minutes.	Turn STANDBY to LOCK once and turn it to STANDBY again.	15
		The battery is dead.	Use a charged battery.	8
	The battery pack is quickly discharged.	The ambient temperature is too low.	—	22
		The battery pack has not been charged fully.	Charge the battery pack again.	8
		The battery pack is completely dead, and cannot be recharged.	Use another battery pack.	23
Operation	START/STOP does not operate.	The tape is stuck to the drum.	Eject the tape.	16
		The tape has run out.	Rewind the tape or use a new one.	—
		The POWER switch is set to PLAYER.	Set it to CAMERA.	14
		The tab on the cassette is out (red).	Use a new tape or slide the tab.	28
	The cassette cannot be removed from the compartment.	The battery is dead.	Use a charged battery or the AC power adaptor.	8, 24
	No function except for cassette ejection works.	Moisture condensation has occurred.	Remove the cassette and leave the camcorder at least an hour.	41
	The tape does not move when a tape transport button is pressed.	The POWER switch is set to CAMERA or OFF.	Set it to PLAYER.	19
		The tape has run out.	Rewind the tape or use a new one.	—
	The autofocusing function does not work.	Shooting conditions are not suitable for autofocusing operation.	Press FOCUS to adjust the focus manually.	32
Picture	The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.	13
	A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high: The camcorder is not malfunctioning.	Change locations.	—
	The color of the playback picture is not appropriate.	A PROGRAM AE mode is selected.	Set PROGRAM AE to the green position.	33
	The playback picture is not clear.	EDIT is set in the direction of the arrow.	Set EDIT in the opposite direction of the arrow.	39
		The channel or input for the camcorder is not selected on the TV.	Select correctly.	18
	The picture is noisy.	The video heads may be contaminated.	Clean the heads using the Sony V8-25CLH cleaning cassette.	42
Others	When you adjust the clock by viewing picture on the connected TV, the area name and area number do not appear on the screen.	The DATA SCREEN function is turned off.	Press the DATA SCREEN button on the Remote Commander.	37
	The supplied Remote Commander does not work.	The REMOTE COMMANDER ON/OFF switch is set to OFF.	Set the switch to ON.	20
		Something interrupts the infrared rays.	Take off the obstacles.	—
		The lithium battery is not inserted with the correct polarity.	Insert the lithium battery with the correct polarity.	7
		The lithium battery is dead.	Insert a new one.	7
		The HOLD switch is working.	Set the switch in the opposite direction of the arrow.	20
	There is dust in the viewfinder.	—	Pull out the viewfinder and clean the viewfinder screen cover or viewfinder lens.	42

Specifications

System

Video recording system	Two rotary heads, Helical scanning FM system
Audio recording system	Two rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette (standard 8 mm)
Tape speed	SP mode: Approx. 1.43 cm (19/32 inches) /s LP mode: Approx. 0.72 cm (5/16 inches) /s (playback only)
Recording time	SP mode: 2 h (P6-120)
Playback time	SP mode: 2 h (P6-120) LP mode: 4 h (P6-120)
Fastforward/rewind time	Approx. 6 min 30 s (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (monochrome)
Lens	Combined 10 × power zoom lens f = 6.2 to 62 mm (1/4 to 1 7/16 inches) F 1.6 to F2.9 (45 to 450 mm when converted to a 35 mm still camera) Filter diameter 37 mm (1 1/2 inches) TTL autofocus system Inner focus wide macro system
Color temperature	Auto
Minimum illumination	1 lx (F 1.6)
Illumination range	1 lx to 100,000 lx
Recommended illumination	More than 100 lx

Input and output connectors

Video output	Phono jack, 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio output	Phono jacks −7.5 dBs, (at load impedance 47 kΩ) impedance less than 2.2 kΩ
RFU DC OUT	Special minijack, DC 5 V
Remote jack	Stereo mini-minijack (Ø 2.5 mm)
MIC jack	minijack, −66 dBs low impedance with 2.5 to 3 V DC, output impedance 6.8 kΩ (Ø 3.5 mm)

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Average power consumption	5.3 W (camera recording) including the viewfinder
Installation	Vertically, Horizontally
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	−20 °C to +60 °C (−4 °F to 140 °F)
Dimensions	Approx. 109 × 109 × 178 mm (w/h/d) (4 3/8 × 4 3/8 × 7 1/8 inches)
Mass	About 770 g (1 lb 11 oz) excluding the battery pack, lithium battery, cassette, and shoulder strap About 1,000 g (2 lb 3 oz) including the battery pack NP-55, lithium battery CR2025, cassette P6-120, and shoulder strap
Microphone	Electret condenser microphone, monaural type
Supplied accessories	See page 5.

Design and specifications are subject to change without notice.

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